

# Analysis of Advertising in E-Sports Broadcasts

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## ABSTRACT

During this decade, esports has become popular, both as an industry and as a spectator sport. However, advertising in the esports broadcasts has not yet reached its full potential if compared to areas such as TV or radio. The goal for this paper was to develop a new kind of advertisement tool using game data to have more interesting and visible advertisement compared to the traditional advertising methods. The implementation was made for the broadcasts of the video game Counter-Strike: Global Offensive, and its effectiveness was measured by a survey. The developed implementation runs automatically with no actions needed by the broadcaster, and according to the survey, the implementation was liked by the respondents, but its advertisement was not remembered any better than traditional advertisements.

## Author Keywords

Esports; advertisements; Broadcasts

## ACM Classification Keywords

- Software and its engineering~Software implementation planning

## INTRODUCTION

Esports broadcasts are still a minor player compared to traditional sports broadcasts seen in television and radio. However, esports have the possibility to develop new advertising methods compared to the traditional sports broadcasts, since they have the potential to apply more adaptive and sophisticated technologies. Even still, static advertisements which have been seen in traditional sports arenas for decades, are usually the only approach even if the effectiveness of the static advertisements of the traditional sports has been questioned even before the first major esports tournaments [1]. Since video games provide new possibilities to how advertisements are presented, there is an incentive to study how they could be utilized.

During the last five years, the money involved in the esports industry has grown to hundreds of millions of dollars [2]. At

the same time, streaming services such as Twitch have given opportunities for anyone to find an audience, just by broadcasting themselves playing video games. In fact, online gaming leagues such as ESEA and FACEIT have provided opportunities for individual players to show their skills to the bigger audiences and to the gaming organizations while reaching for the goal of becoming professional gamers [3,4].

In the video game Counter-Strike: Global Offensive (CSGO) two teams of five players try to reach 16 round wins to achieve an overall map win [5]. Rounds can last from 15-20 seconds up to two and a half minutes, and it is possible that all the players are involved in the action at the same time. At times, the action might be chaotic and even the experienced observers and commentators might have difficulties in noticing all the key moments. In the beginning of every round in the game, there is also a so-called “freezetime”, which is usually the time for the commentators to discuss the actions of the previous round.

By developing a new analyzing tool for commentators using the Game State Integration of CSGO, it is possible to help the commentators with their analysis and to provide a new advertising element to the broadcasts. Helping the commentators with their analysis helps to create more attractive broadcasts to gain more viewership both to the broadcasting channel, and to the teams that are playing. When the statistics are shown for the audience, it provides both new information to the viewers and at the same time allows advertising the sponsors of the broadcast. After all, advertisement providing information is less irritating for the viewer than a non-informational advertisement [6].

The main goal for this paper was to implement a new advertising tool which is also a useful analyzing tool. Implementation will be used for analysis to define the key moments of the round for the viewers and allow for informative and esthetic user interface (UI), while allowing a sponsor logo to be seen at the same time. The UI element of the implementation will be more of a Proof of Concept instead of a real, production-ready element, with logos placed in the space that is left unused by the presentation of statistics. Other goals are to document the implementation and measure the effectiveness of the advertisements against the traditional static advertisements and logo areas.

To achieve this, Design Science Research (DSR) was used in this paper by developing a new artifact to help to understand the chaotic rounds of CSGO and to provide a new advertising method at the same time. The research process

consisted of identifying a problem before designing and developing a new artifact to help with the problem and finally evaluating the artifact [7]. Overall, the research question is *“How to design a more noticeable advertisement for esports broadcasts without making audience more irritated by it?”*

The rest of the paper is structured as follows. Section 2 discusses the works related to our research, whereas Sections 3 and 4 discuss the setting and the obtained results. Section 5 discusses the potential implications, and Section 6 closes the paper with the conclusions.

## RELATED RESEARCH

The in-game advertisements have emerged as a new platform for companies to advertise their products in esports and digital entertainment. There are also a lot of different methods that can be used to raise awareness of the brands that are sponsoring game developers to select from. For example, Ip [8] lists main types of in-game advertising being for example real life or movie characters as in-game characters or branded in-game assets or tools.

There are also entire game franchises based on movie franchises, such as the Lego video games for both PC and gaming consoles [9], or sports games using person brands or purchased licenses to use real life teams and players, including logos and sponsors [10]. The study by Ip noted that this type of in-game advertising is sometimes not even considered as advertising by the players, because it adds immersion to the product. The lack of interaction with the advertisements decreases the likelihood of the player noticing the advertisement and the advertised brand with it [8]. However, it is noted that it is difficult to measure how much these advertisements have subtle effects on player's perceptions of the advertised brands.

Research paper by Li et al. [11] studied a possibility of adding advertisement automatically to the broadcast. The research listed several reasons why virtual advertisements, advertisements inserted into the user interface layout, are more effective than static billboard advertisements and commercial breaks. For example, billboards might not be seen because other objects could be in front of them, or that users simply do not watch the broadcast during a commercial break. With virtual advertisements, the user has to watch also the ads if they wish to see the content. The criteria for placing advertisements is also discussed, and it includes elements such as that the advertisements should not block any foreground objects because that annoys the audience, or that advertisement should stay static for a period of time so that it can attract the attention of the audience.

Esports broadcasts have an advantage with virtual advertisements because in terms of gameplay footage, the environment and camera setups are virtual too, unlike in the traditional sports broadcasts. Also, when the gameplay is shown in the broadcast, it is always known which areas of the screen are less informative, meaning that they are good

spots for the advertisements since there are no gameplay elements in the area to be obstructed (e.g. [12]). The common placement of advertisements is demonstrated in Figure 1.

In a study by Grace et al [13], it was studied if in-game advertising was more effective for onlookers than players, which are familiar with the electronic entertainment. The research concluded that viewers who have played the game themselves can be more motivated to focus on the core game mechanics instead of watching the advertisements. In the research it was found that onlookers remembered the in-game billboard advertisements significantly better than the players who are more familiar with the game, mainly because onlookers are less motivated to look at the game mechanics, shifting their focus more towards the advertisements [13].



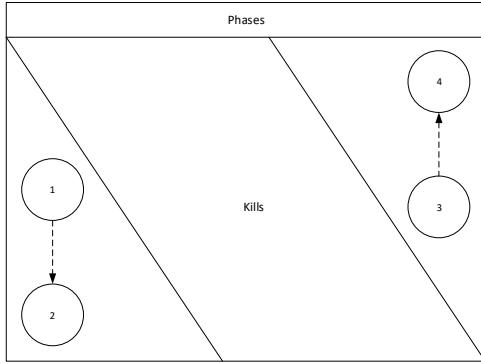
Figure 1: Typical advertisement locations

## RESEARCH SETTING

As an additional advertising model, some tournament organizers have used branded replays showing the logo and name of the advertising brand while playing the replays of key moments of the rounds [14]. Forming the replays and showing them on screen is difficult if the broadcaster does not have at least one dedicated person to parse the replay, or if the system does not offer one automatically. Implementation of our tool informs the viewer about the key moments of the rounds without any actions by the broadcaster. The implementation gathers this data automatically, builds the presentation with the advertised logos, and slides it to the broadcast without any actions from the broadcaster.

The implemented ad system is shown to the audience when the current round is over, and hidden when the next round starts. Implementation provides both information about the ongoing match and a changing position for the advertised logos. It also automatically applies the Game State Integration (GSI) of CS:GO which enables the possibility to fetch useful in-game data which cannot be seen in the graphical user interface of the game.

Using the GSI requires a listening server, which catches network requests made by the game. The data provided in the requests needs to be analyzed by a program to find out if it is valuable or not. After analyzing the data, it needs to be presented with a simple yet attractive way to catch the eye of



**Figure 2: Implemented advertisement tool ad locations**

the viewer towards both the provided statistics and the logo of the sponsor. This backend was made with the Node.js server which picks up HTML POST requests from the game client, while the frontend is a web page which can be viewed in a browser or in the streaming software. Node.js server receives JavaScript Object Notation (JSON) formatted payloads from the game, analyzes them and sends parsed data to the frontend using a web socket made by socket.io library.

Web page updates itself depending on the data sent by backend and is served by the Express web application framework [15]. This implementation does not use any kind of database, the information is stored only in the web browser and the runtime of the backend during the time it is open on a client system. When the round is over, the implementation tries to calculate the best possible placement for the advertised logo. There will always be room for the advertisement in either the top-right corner or the bottom-left corner because of the UI design: If there is not enough room for the advertisement in the bottom left corner, all the eliminations of the round have occurred in the beginning of the round leaving the top-right corner empty and if there is not enough room for the advertisement in the top-right corner, eliminations and actions of the round have occurred in the later seconds of the round leaving bottom-left corner empty. Following this logic, the advertisement will be placed in the center of the leftover space between the drawn elements, and the borders of the canvas. The order in which the placement of the advertisement will be attempted is 1) Middle-left, 2) Bottom-left, 3) Middle-right and last 4) Top-right. Figure 2 presents a simplified demonstration how the implementation tries to place the advertised logos, from



**Figure 3: Three examples of the made-up logos: Swift mobile was applied only in the summary screen, while others were used in the static advertisements.**

which some examples are presented in Figure 3. Imaginary organizations were used to simplify the permission process, and to eliminate the popularity or recognizability bias between the different brands.

### SURVEY SETUP

Evaluation of the implementation was measured by creating two surveys. The surveys were almost identical, but Group A did not see the end-round advertisements at all, only the classic static advertisements of the UI. The comparison Group B had the same static advertisements, but they could see also the implementation advertisements in the summary screen. With this arrangement it was possible to find out if implementation advertisements had any effect, and compare them to the static advertisements. Technically this approach was a type of A/B testing, where the focus was on the added features, not on the directly competing solutions [16]. Open feedback was also collected as it contained more structured opinions from the respondents. In the surveys, there were three different methods to measure the usefulness of the implementation:

1. How many advertisements respondents could remember
2. Measuring opinions about advertising method(s)
3. Open questions (voluntary for respondents)

Mann-Whitney U test was used to find out if there were significant differences between the opinions of A and B group about the static advertisements. It was also used to see if respondents of group B had significant differences of opinion regarding the advertisement printed in the implementation compared to the static advertisements.

All the respondents were given a link to a Google Form which contained a link to an unlisted YouTube video and survey questions. Both groups saw a video of the same round of CSGO match with the same game audio and voice commentary. Both surveys were done fully online. Both videos lasted two minutes and 44 seconds and contained four static advertisements. Group A saw four static advertisements in the center bottom of the screen while Group B saw the same static advertisements and the implemented summary screen advertisements. Static logos were visible the whole time, two minutes and 44 seconds in both videos, while the implementation was shown only 17 seconds during the round ending time and “freezetime”. The original round was recorded using Open Broadcaster Software (OBS) Studio which was also used to inject the advertisements. It was decided not to talk about advertisements in the commentary of the survey so that both groups could have the same commentary. The survey was done by respondents with the following process: 1) Watch the video, 2) Close the video before answering how many advertised brands or logos could be memorized, and 3) Possibility open the video again and answer questions about static advertisements. Group B was also asked to answer questionnaire concerning the summary as a fourth phase.

Questions of the survey were modified from Viewer Response Profile (VRP) items [6]. VRP questions are designed originally for television commercials and because of that, questions were modified for the needs of static advertisements and the implementation. The purpose of the VRP items was to test three things: 1) Evaluate whether there were significant differences in opinions towards static advertisements if the more active implementation advertisement was shown, 2) Evaluate if respondents enjoyed the implementation advertisement significantly more than the static advertisements, and 3) Evaluate if respondents thought the implemented advertisement was too complex. Mann-Whitney U method was used to find out if there were significant differences in two different sets of responses.

According to conventions statistical hypothesis testing, the hypothesis is confirmed if p value is less than 0.05 [17]. Basically, the null hypothesis  $H_0$  is defined as following for every question  $H_0$ : *There is no significant difference between advertising methods* and  $H_1$ : *There is a significant difference between advertising methods*.

## SURVEY RESULTS

Listing the advertised brands from memory went poorly for nearly all the respondents. Some of the respondents in group A thought that the team names were the only advertised companies in the video. Even when the advertisements were noticed, only a maximum of 1-2 advertised brands were remembered and more than half of the respondents could not name any of the companies. In the group A, 13 respondents out of 23 did not remember any companies at all. The numbers were similar in group B, where 15 respondents out of 24 could not remember anything particular. Only one participant listed all information perfectly, as an outlier.

Many responses contained partly correct names, so evaluation was done by using a point system where correct answer was 1 and partly correct answer 0.5p. Unfortunately for the implemented summary screen and our test control, Swift Mobile was not the most remembered company. The ads in the summary screen implementation were noticed, but the advertisement in it was not remembered any better than two of the four static advertisements. In this sense, the implemented tool was not successful. The results for remembered companies are summarized in Table 5.

**Table 5. Points per brand in the listing task.**

Brand	Group A points	Group A %	Group B points	Group B %
Swift Mobile	-	-	3	12.5%
Ultralight Networks	4.5	19.6%	3	12.5%
TropicBets	3	13.0%	4	16.7%
Buzz	2	8.7%	1	4.2%
Strongtech	1	4.3%	0	0%

Overall, there were 23 respondents in the group A and 24 respondents in the group B, collected mainly from volunteers in a number of college-student aimed esports and gaming events. Group A had only the static advertisements, whereas

Group B saw also the additional summary screen advertisement. Basic comparison of only mean and median values of observations yielded only little information; the Group A and Group B answered similarly to the degree where there were no statistically significant differences. However, if we observe the Group B and the different advertisement styles, there are differences illustrated in Table 6.

**Table 6. Comparison of static vs. implemented summary screen advertisement types with Group B.**

Question	U	p	Mean (static)	Mean (impl.)	Med. (stat)	Med. (impl.)
I thought the advertising method was clever and entertaining.	109.5	.00024	2.46	3.88	2	4
These are the kind of advertisements that keep running through your mind after you have seen them.	114.5	.00036	1.58	2.88	1	3
The advertisement was too complex. I was not sure what was going on.	195	.05614	1.58	2.08	1	2
It required a lot of effort to follow the advertisements.	258	.54186	2.58	2.25	2	2
These kinds of advertisements have been done many times. It is the same old thing.	76	<.00001	4	2.21	4	2
I have seen this advertising method so many times—I am tired of it.	139	.00222	2.92	1.75	3	1.5
I think that this is an unusual advertising method, I am not sure I've seen another one like it.	75.5	<.00001	1.5	3.17	1	3.5
The advertising method irritated me — it was annoying	213	.12356	2.08	1.42	1.5	1

For example, “I thought the advertising method was clever and entertaining.” had a quite neutral value from the Group B for the static advertisements, 2.46, while the implemented advertisements got much more positive feedback, score 3.88. The next question, “These are the kind of advertisements that keep running through your mind after you have seen them.” had similar difference, 1.58 compared to 2.88 so implementation was received better in both questions of this category.

Confusion category had two questions and neither of them had significant difference between the advertisement types. However, “The advertisement was too complex. I was not sure what was going on.” was pretty close to statistical significance ( $p = .05614$ ) with static advertisements having unsurprisingly good mean of 1.58 and implementation having 2.08. The difference was expected in this question because there was not really anything to understand with the static advertisements while the implementation included statistics without explaining them beforehand. The second question, “It required a lot of effort to follow the advertisements.” was very neutral for both advertisement

types since the static advertisements had mean of 2.58 and the implementation had 2.25.

All three questions for the familiarity category had significant differences as expected. The first two questions had slightly negative tone for the advertisement being too familiar. The static advertisements received 4.00 mean for the question “These kinds of advertisements have been done many times. It is the same old thing.” While the implementation received 2.21 for the same question. “I have seen this advertising method so many times—I am tired of it.” was tonally more aggressive and it received 2.92 for the static advertisements, and only 1.75 for the implementation since implementation has not been used in many broadcasts yet and included a surprise factor of round statistics. The third question “I think that this is an unusual advertising method, I am not sure I’ve seen another one like it.” had a mean of only 1.5 for the static advertisements while the implementation had 3.17. In the first and third question p value was smaller than .00001 which means very significant difference when significant difference is smaller than 0.05.

The only question in the alienation category was important for the research question, because it measures the irritation towards the advertisements: “The advertising method irritated me — it was annoying”. There was no significant difference between the advertising methods in this question with p being .12356. As a positive aspect for the implementation, it had better mean of 1.42 against 2.08 of the static advertisements. Overall the results of Mann-Whitney U indicate that summary screen and its advertisements were a significantly more entertaining and newer advertising method which was not seen as more irritating by the viewers. Additionally, the result for the question “These are the kind of advertisements that keep running through your mind after you have seen them.” was also significantly better for the implementation advertisement.

Additionally, open feedback was collected from all of the participant groups. The open feedback provided valuable information about the advertisements, survey and on the aspect of what the viewers actually notice in esports broadcasts in general. Even though the summary screen implementation was seen as an enjoyable advertising method by the respondents, there were some constructive feedback about separating the advertisement and statistics more clearly:

*“The design of the advert could be improved so that it is clear that the round summary and the advert are two separate entities.”* -Respondent #7 Group B

Both the static advertisements and the implementation could have looked a little bit more polished. As the UI of the implementation was more of a “Proof of Concept”, the following feedback did not come as a surprise:

*“Needs to have some pretty graphics so it doesn’t look so rough for the viewers.”* - Respondent #10 Group B

Two respondents pointed out the biggest problems of both the static commercials and the survey rather well:

*“Problem with static commercials is that they can’t be where one actually keeps their eyes while watching CS:GO. My eyes never went down where the commercials were the whole time.[...].”* -Respondent #1 Group B

*“The best thing about them is that they don’t cover up any of the vital gameplay elements, and that they aren’t distracting. I feel that they would be more effective when you’re exposed to them for a longer period of time.”* -Respondent #17 Group B

Respondent #16 noted importantly, that the static commercials are usually known brands instead of made-up companies, which helps viewers to spot the logos:

*“The advertised companies should be related to gameplay so that people who usually watch the stream can relate to them better ie. HyperX, Nvidia etc. ...”* - Respondent #16

There were some complaints that advertisements should have had bigger logos and texts to be easier to recognize:

*“I don’t even pay attention to them in the first place. I had to rewatch the video to answer the first question. Also they are pretty small.”* -Respondent #5 Group A

*“Too many logos that were all too small in my opinion”* - Respondent #11 Group B

## DISCUSSION

The implemented advertisement system was designed for the needs of esports broadcasting. There were no strict requirements other than offering extra information and a spot for a new advertisement at the same time. The survey did not measure opinions on the information given by the implementation, but the open feedback provided some ideas and pointed out problems which could be fixed. In terms of Design Science Research, a new artifact was created to help with existing problem, and it was evaluated using a survey. The research cycle and the basic guidelines of Design Science Research was adapted from Guideline by Hevner [7]. In general, the validity of the research was evaluated by using Wohlin et al. [17] as a guideline.

The implementation was more of a “proof of concept” instead of being an advertising tool ready to be used in an official tournament broadcast. In the future, there should probably be a presentation text with the logo, for example: “Round recap provided by”, which would help new viewers to understand more quickly which part of the implementation are placed advertisements and which are statistics and gameplay information.

The video clip in the survey lasted only one round while the viewers spend usually a lot more time watching the stream. A regular match lasts at least 16 rounds so there is a lot more time for the viewers to look at the advertisements during the broadcast. A more in-depth research on this subject would include watching a longer video with more polished

advertisements. It would probably help if the advertised companies were real, existing brands and were not completely new and unknown to the users, like in this test run. The weak results of the question “List all advertisements you can remember” were indicative of the users missing the advertisement spots, but on the other hand the results show how easily the advertised brands are ignored. Overall, by using imaginary logos we also sidestepped the problem of the brand recognition being different for different user groups.

If a similar study is done in the future, there could also be a method which was used by Grace et al. [13] where addition to listing all the advertisements from memory, all the eight logos and 16 extra logos were shown to the respondents. In future studies, this could improve the overall accuracy now that we have a baseline in which no extra logos were applied.

## CONCLUSIONS

Advertising methods in esports should be examined more thoroughly because the industry is still growing. The esports industry and broadcasts are full of advertising opportunities different from the traditional sports broadcasts but the static advertisements are still used to a surprising degree. In this paper, we provided a solution to deliver extra information automatically, and studied the static advertisements against more adaptive approach, which based on our prototype results was considered more appropriate method of advertising in an esport event.

It was found that this survey did not deliver strong results, but considering the open feedback given by respondents, implementation advertisement is a good addition to the esports broadcast advertising methods. It provides useful information about the previous round, instead of being just another advertisement. It was noted that the looks of the implementation should be refined and that too excessive use of it as an advertising method could make it irritative similarly to the static advertisements.

The research question “How to design a more noticeable advertisement for esports broadcasts without making audience more irritated by it?” was not completely solved, but steps were taken towards the right direction. The overall result might have been different with real logos or by making the logo more visual. However, all the three objectives for the research were completed, and the implementation yielded useful information for future designs and refinement.

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